City of Bellevue
Development Services Department
Land Use Staff Report

Proposal Name:	COBU Glacier Key Culvert Replacement
Proposal Address:	Glacier Key culvert is in the Glacier Key right-of-way, adjacent to properties addressed at 51, 54 Glacier Key and 52, 54 Skagit Key
Proposal Description:	The City of Bellevue Utilities Department proposes to replace an existing culvert conveying Coal Creek under Glacier Key with a new single-span bridge structure to meet current design guidelines for fish passage, flood conveyance, debris passage, and traffic safety. The culvert replacement is Phase 3 of the Lower Coal Creek Flood Hazard Reduction Project (LCCHRP) which will replace a total of five culverts in the Newport Shores neighborhood.
File Number:	18-123725-LO
Applicant:	James Stockwell, Senior Utilities Engineer, City of Bellevue
Decisions Included:	Critical Areas Land Use Permit (Process II. LUC 20.30P)
Planner:	Peter Rosen, Senior Environmental Planner
State Environmental Policy Act Threshold Determination:	**Determination of Non-Significance:** previously issued for Lower Coal Creek Flood Hazard Reduction Project (LCCHRP) project under Permit #16-145319-LO
Director's Decision:	**Approval with Conditions** Michael A. Brennan, Director Development Services Department By: Michael M. Brennan Elizabeth Stead, Land Use Director

Date of Application:	August 29, 2018
Notice of Application:	October 4, 2018
Decision Publication Date:	December 20, 2018

Deadline for Appeal of Process II Administrative Decisions:
Critical Areas Land Use Permit (LO): January 3, 2019

For information on how to appeal a project proposal, visit the Permit Center at City Hall or call 425-452-6800. Appeal of any Process II Administrative decision must be made by 5 p.m. on the date noted for appeal of the decision. Appeal of the Critical Areas Land Use Permit must be made to the City of Bellevue City Clerk's Office.

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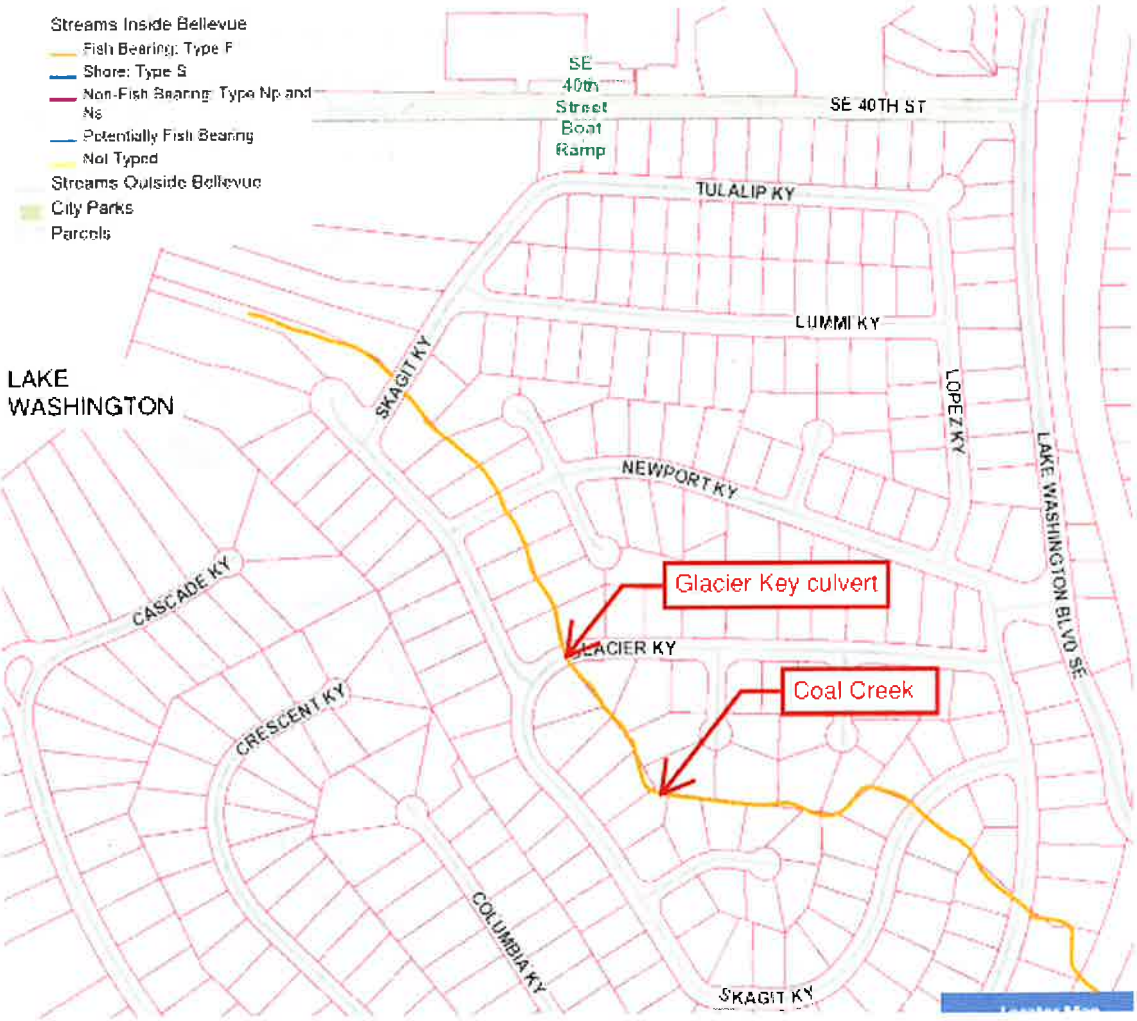
Attachments

1. Project Plans – Attached
2. Riparian Restoration Plan - Attached
3. Critical Areas Report – In File

I. Proposal Description

The City of Bellevue Utilities Department proposes to replace an existing culvert conveying Coal Creek under Glacier Key with a new single-span bridge structure to meet current design guidelines for fish passage, flood conveyance, debris passage, and traffic safety. The culvert replacement is Phase 3 of the Lower Coal Creek Flood Hazard Reduction Project (LCCHRP) which will replace a total of five culverts in the Newport Shores neighborhood. Figure 1 below shows the location of the Glacier Key culvert.

FIGURE 1 – PROJECT LOCATION



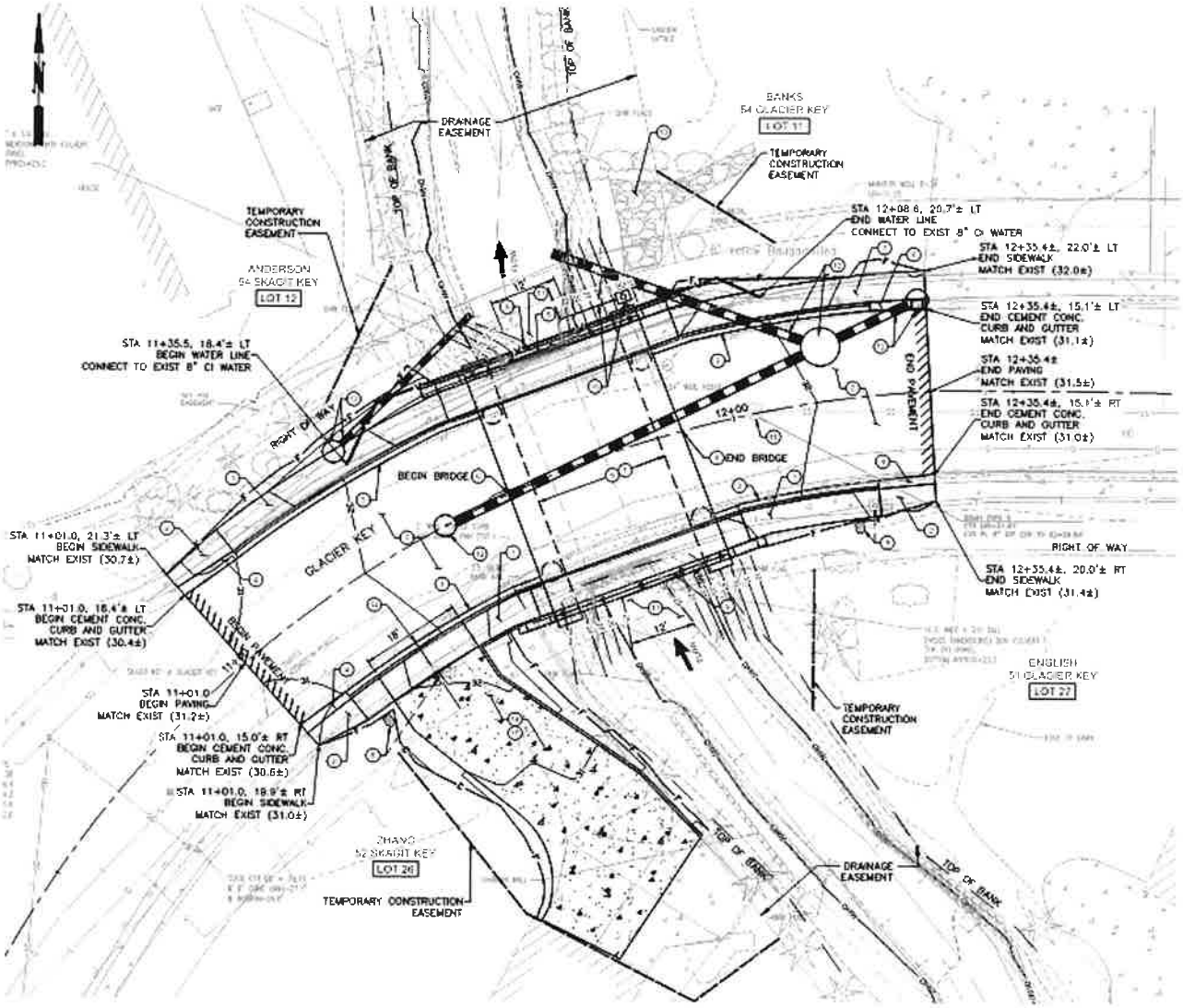
The existing four-sided box culvert is 10-feet-wide, 6-feet-tall, and 45-feet-long located under the Glacier Key roadway. The culvert is reportedly undersized to accommodate flow from a 100-year flood event. The existing culvert is proposed to be replaced with a single-span bridge and reconstructed creek channel that will accommodate 100-year flood event flows and enhance fish passage. The new bridge structure will simulate the natural stream dimensions; allowing sediment and debris to pass through and providing fish unhindered passage beneath the roadway. The new bridge will have approximately 1.0 feet of freeboard above the 100-year flood elevation.

The new bridge is approximately 60 feet long, with a span of approximately 25 feet across the creek, supported by four (4) drilled shafts (one at each corner of the bridge), a cap beam between the shafts parallel to the stream, and a precast concrete slab deck. Existing City-owned and franchise utilities that conflict with the proposed new structure will be relocated within the existing right-of-way.

A buried stormwater siphon pipe is proposed to be installed beneath the creek channel. The siphon will be connected to deep manhole structures on each side of the new bridge and the area stormwater system. It will be constructed using a combination of open excavation with water tight shoring (such as sheet piling) with internal dewatering.

The stream channel through the bridge structure is designed so that the shape of the cross-section and stream gradient match with the existing stream channel configuration of the reach near the structure. The channel will be reconstructed with gravel and cobble materials that matches the stream substrate in the adjacent reaches. No habitat structures or large woody debris are being installed at this location.

FIGURE 2 – SITE PLAN



The proposed culvert replacement is identified as an allowed activity in the City of Bellevue Land Use Code (LUC) section 20.25H.055.B, although a Critical Areas Report is required under LUC 20.25H.080.B.2 for in-stream channel and bank modifications associated with the culvert replacement.

Lower Coal Creek Flood Hazard Reduction Project

The Lower Coal Creek Flood Hazard Reduction Project proposes to replace five culverts in the Newport Shores neighborhood with five new single-span bridge structures that meet current design guidelines for fish passage, flood conveyance, debris passage, and traffic safety. Replacement bridge structures would be located where Coal Creek is crossed by the following roadways: Cascade Key, upper Skagit Key, Glacier Key, Newport Key, and lower Skagit Key. Regrading of the stream bank and installation of stabilization measures is necessary to install the upgraded bridge structures.

The project will be implemented in stages due to budget limitations and to minimize construction-related disturbance to the neighborhood. The total timeframe for project implementation will be approximately four to five years. Phase 1 of the project replaced the upper Skagit Key culvert (16-145319-LO) and Phase 2 replaced the culverts at Cascade Key and Newport Key (17-120050-LO). Phase 3 will replace the lower Skagit Key (18-125205-LO, 18-125206-WG) and Glacier Key culverts (18-123725-LO). SEPA review for the entire Lower Coal Creek Flood Hazard Reduction Project was completed under the first permit,16-145319-LO.

II. Site Description, Zoning, Land Use, Critical Areas and Shorelines

A. Site Description

The proposed project site is located in the Newport Shores neighborhood located to the west of Interstate 405 (I-405) and adjacent to Lake Washington. The neighborhood is characterized by single family development abutting a series of canals connecting to Lake Washington.

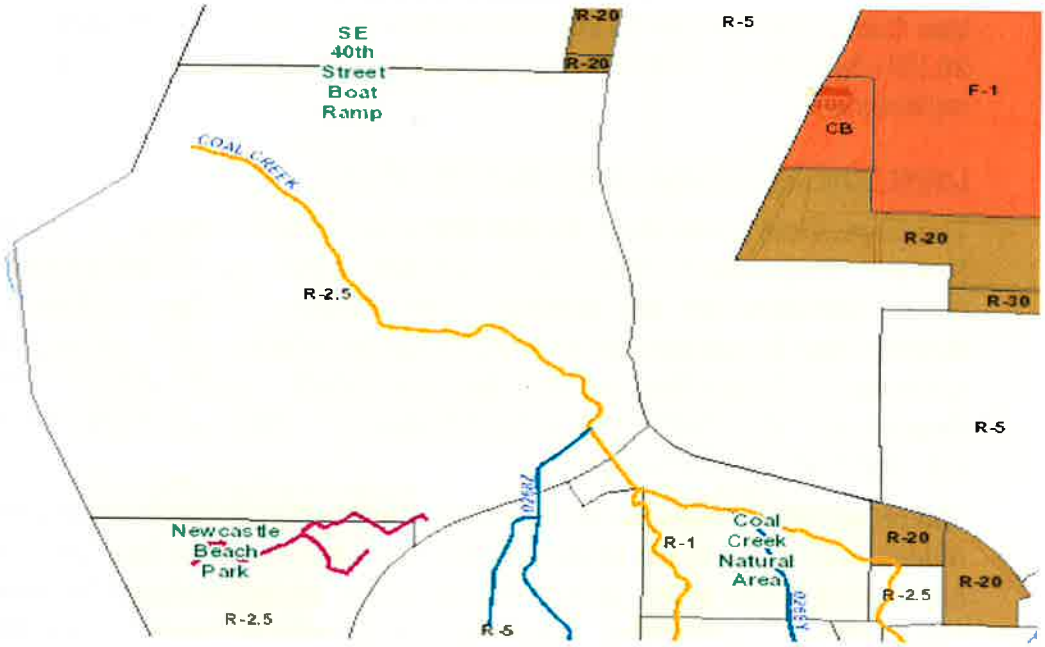
Streambanks along Coal Creek in the Newport Shores neighborhood have been extensively modified by armoring, bulkheads, and maintained residential landscaping. Vegetation consists primarily of manicured lawns and gardens, with a mix of native and non-native trees.

B. Zoning/Comp Plan Designation

The site and surrounding area is zoned as residential R-2.5 (Single Family – 2.5 DU/Acre) with a Comprehensive Plan Land Use Designation of SF-M. See Figure 3 below.

The project site is within the Critical Areas Overlay District (LUC 20.25H) due to the presence of Coal Creek and associated floodplain.

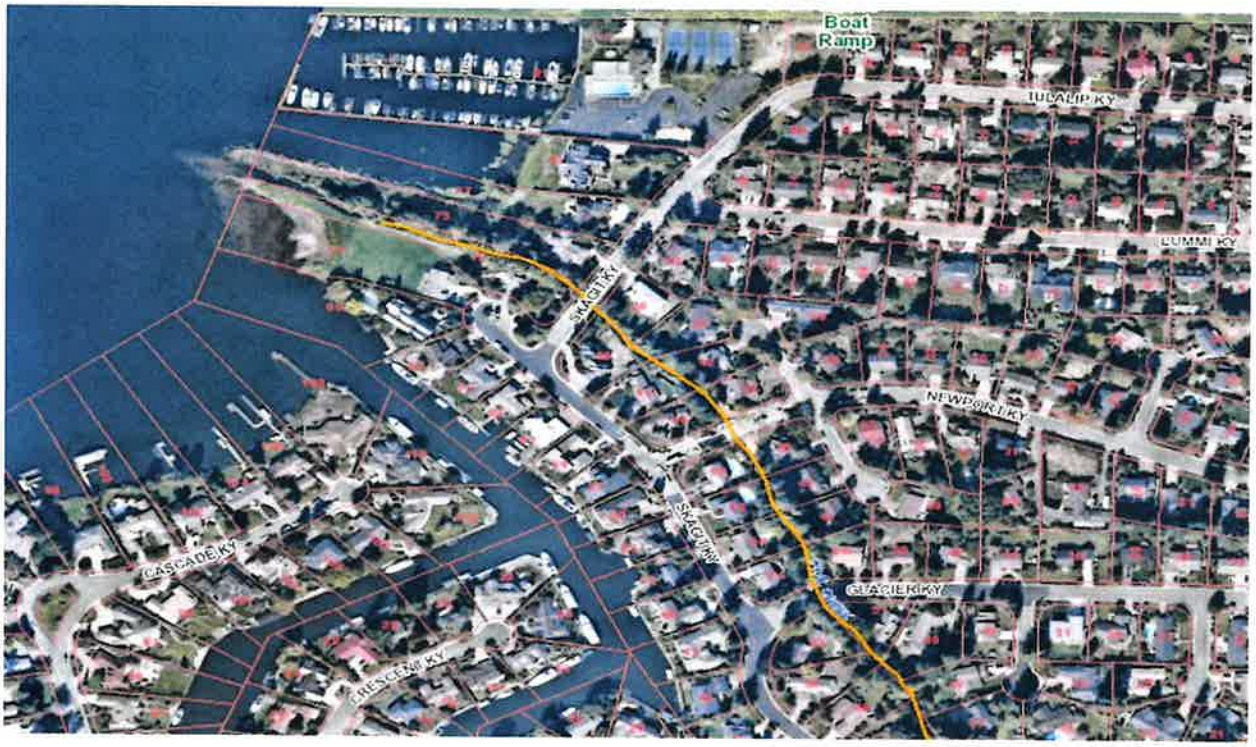
FIGURE 3 – ZONING MAP



C. Land Use Context

The Glacier Key culvert is a roadway crossing within a residential neighborhood. The culvert conveys Coal Creek which flows through the neighborhood into Lake Washington. There is a neighborhood yacht club and community club within the neighborhood. Newcastle Beach Park, a City of Bellevue park, is located to the south of the neighborhood. No changes in land uses are associated with the planned culvert replacement.

FIGURE 4 – SITE CONTEXT



D. Critical Areas Functions and Values

i. Streams and Riparian Areas – LUC 20.25H.075

a. Stream and Riparian Area Functions: Most of the elements necessary for a healthy aquatic environment rely on processes sustained by dynamic interaction between the stream and the adjacent riparian area (Naiman et al., 1992). Riparian vegetation in floodplains and along stream banks provides a buffer to help mitigate the impacts of urbanization (Finkenbine et al., 2000 in Bolton and Shellberg, 2001). Riparian areas support healthy stream conditions.

Riparian vegetation, particularly forested riparian areas, affect water temperature by providing shade to reduce solar exposure and regulate high ambient air temperatures, slowing or preventing increases in water temperature (Brazier and Brown, 1973; Corbett and Lynch, 1985).

Upland and wetland riparian areas retain sediments, nutrients, pesticides, pathogens, and other pollutants that may be present in runoff, protecting water quality in streams (Ecology, 2001; City of Portland 2001). The roots of riparian plants also hold soil and prevent erosion and sedimentation that may affect spawning success or other behaviors, such as feeding.

Both upland and wetland riparian areas reduce the effects of flood flows. Riparian areas and wetlands reduce and desynchronize peak crests and flow rates of floods (Novitzki, 1979; Verry and Boelter, 1979 in Mitsch and Gosselink, 1993). Upland and wetland areas can infiltrate floodflows, which in turn, are released to the stream as baseflow

Stream riparian areas, or buffers, can be a significant factor in determining the quality of wildlife habitat. For example, buffers comprised of native vegetation with multi-canopy structure, snags, and down logs provide habitat for the greatest range of wildlife species (McMillan, 2000). Vegetated riparian areas also provide a source of large woody debris that helps create and maintain diverse in-stream habitat, as well as create woody debris jams that store sediments and moderate flood velocities.

Sparsely vegetated or vegetated buffers with non-native species may not perform the needed functions of stream buffers. In cases where the buffer is not well vegetated, it is necessary to either increase the buffer width or require that the standard buffer width be restored or re-vegetated (May 2003). Until the newly planted buffer is established the near term goals for buffer functions may not be attained.

Riparian areas often have shallow groundwater tables, as well as areas where groundwater and surface waters interact. Groundwater flows out of riparian wetlands, seeps, and springs to support stream baseflows. Surface water that flows into riparian areas during floods or as direct precipitation infiltrates into groundwater in riparian areas and is stored for later discharge to the stream (Ecology, 2001; City of Portland, 2001).

b. Site Conditions: The Glacier Key culvert conveys Coal Creek, which is a "Type F", fish-bearing stream. The adjacent streambanks have been extensively modified by

armoring, bulkheads, and residential landscaping. Vegetation consists primarily of manicured lawns and gardens, with a mix of native and non-native trees.

Coal Creek

The lower reach of Coal Creek, including the project area, was affected by the development of Newport Shores and surrounding area, excavation of canals, channelization, and bank armoring. Large woody debris (LWD) is largely absent from the channel in this reach. The City of Bellevue added approximately 450 pieces of LWD in the upstream reach in 2006 (CH2M HILL 2011) and has added several hundred additional pieces of LWD farther upstream and in other locations such as the Newport Creek tributary. A large metal rack located at the outlet structure of the upstream storm detention pond, just east of I-405, effectively prevents LWD from traveling downstream where it could contribute to flooding.

Increased sedimentation and altered sediment transport processes have been a longstanding problem in Coal Creek (Kerwin 2001). The large sediment load degrades potential spawning habitat by increasing the amount of fines and increases flooding in depositional areas by reducing channel capacity. The two dominant sources of sediment are stream bank erosion and landslides of the steep slopes above the stream, including occasional catastrophic failures of tailing slopes that remain from the old coal mining activities in the stream's headwater areas. In the 1990s, fine sediments were found to comprise more than 50 percent of the substrate in the reach downstream of I-405 and 25 percent of the substrate in upstream reaches (Kerwin 2001).

Since then, the City of Bellevue and King County have implemented numerous measures to reduce watershed sediment sources, trap and remove stream sediments, and reduce flood peaks entering the Newport Shores neighborhood. These measures have proven highly effective at controlling sediment delivery to the neighborhood (NHC and Tetra Tech 2015). Results of grain size analysis indicate that the surface bed material along Coal Creek in the action area is uniformly graded and composed of coarse gravel and cobbles forming a distinct armor layer. In samples collected in 2013, particles smaller than 10 millimeters made up less than 10 percent of the substrate; comparable values from studies conducted in 1996 and 1984 ranged from 30 to 55 percent (NHC and Tetra Tech 2015).

The loss of channel complexity identified as a limiting factor by Kerwin (2001) is the result of numerous factors, including lack of LWD and manipulation of the channel between the mouth and I-405. Degraded riparian conditions are most pronounced along the lower reach downstream of I-405 in the project area. Although the middle and upper reaches do contain large forested areas, these reaches are dominated by deciduous species that became established after logging and the extensive coal mining activities ceased. Historically, mature coniferous forest would have been the dominant component of the riparian zone and would have contributed LWD to this stream system (Kerwin 2001).

Data from benthic invertebrate sampling studies conducted in 1998, 2001, and 2002 indicated poor to very poor biological conditions in Coal Creek (Bollman 2009). Sediment deposition likely influenced the composition of assemblages at the sampling site, which was approximately 1.25 miles upstream of the action area. The absence of metal-sensitive invertebrates from samples could be an indication of metals contamination (Bollman 2009)- See Critical Areas Report, Attachment 3 for additional discussion.

c. Stream Impacts and Mitigation

The culvert replacement would result in temporary impacts to Coal Creek during work to remove the existing culvert, install the new bridge structure, reconstruct the stream channel within the affected project reach, stabilize stream banks, and to restore the disturbed riparian area. The length of stream channel affected depends on the upstream and downstream limits of work and areas need for bank stabilization. The extent of clearing and grading in the riparian zone will be kept to the minimum necessary to allow construction. The length of affected stream and the area of clearing and grading in the stream buffer is summarized in the table below:

New Bridge Location	Length of Affected Stream Reach	Area of affected Critical Areas Buffer
Glacier Key	150 feet	3,200 square feet (0.073 acre

Portions of Coal Creek's riparian buffer would be temporarily affected by clearing and grading. The affected areas are dominated by non-native and low-growing species. Approximately 5 trees would be removed at Glacier Key.

During construction, the stream will be diverted (bypassed) through a pipeline located within the stream channel to allow work to be completed in dry conditions and to protect water quality during construction. The bypass will be sized to convey a 2-year peak flow. The stream bypass and will be adjusted to avoid tree and/or shrub removal and substantive clearing.

The subject project and overall Lower Coal Creek Flood Hazard Reduction Project (LCCFHRP) is not expected to result in any permanent or cumulative adverse impacts on Coal Creek. The project will generate several benefits to Coal Creek associated with reductions in flooding, stream bank scour and erosion. Replacement of the existing culverts with bridge structures is expected to result in long-term beneficial effects for fish and fish habitat, primarily through the development of a channel configuration that more closely resembles historical conditions, which will result in reduced bed and bank erosion and moderated flow disturbance. Removal of the existing culverts may also facilitate fish passage when discharge volumes and water velocities are relatively high. The riparian buffer restoration includes native plant species that provide higher-habitat values than existing vegetation. As the plantings mature, they will improve ecological functions for fish and wildlife habitat, food chain support, and water temperature maintenance. Native conifer trees (Douglas Fir,

Western Red Cedar) included in the planting will mature over time and provide shade and large woody debris to Coal Creek. See Riparian Restoration Plan, Attachment 2.

ii. Areas of Special Flood Hazard - LUC 20.25H.175

a. **Floodplain Functions:** The value of floodplains can be described in terms of both the hydrologic and ecological functions they provide. Flooding occurs when runoff exceeds the capacity of rivers and streams to convey water within their banks, or when engineered stormwater systems become overwhelmed. Floodplains diminish the effects of urbanization by temporarily storing water and mediating flow to downstream reaches. The capacity of a floodplain to buffer upstream fluctuations in discharge may vary according to valley confinement, gradient, local relief, and flow resistance provided by vegetation. Development within the floodplain can dramatically affect the storage capacity of a floodplain, impact the hydrologic regime of a basin and present a risk to public health and safety and to property and infrastructure.

b. **Site Conditions:** The project site includes the mainstem of Coal Creek where base flood elevation has been determined and mapped by FEMA Flood Insurance Rate Maps as being within Zone AE. The mainstem channel is also defined as being within the special flood hazard area that is inundated by the 100-year flood. The 100-year floodplain is confined to the mainstem of Coal Creek. It should be noted that the limits of the FEMA mapped flood zones are not consistent in all areas with the flood hazard areas and information identified in NHC and the Tetra Tech reports (2015, 2016) because the FEMA mapping is inconsistent with the current stream channel alignment in some areas. Details regarding flood occurrence and the associated flood hazard risks are discussed in the *Preliminary Predesign Report* (Tetra Tech 2016) and the *Lower Coal Creek Flood Hazard Reduction Alternatives Analysis* (NHC and Tetra Tech 2015).

c. **Impacts**: One of the main purposes of the Lower Coal Creek Flood Hazard Reduction Project (LCCFHRP) is to reduce the current flood hazard in the Newport Shores neighborhood. The overall project includes replacement of all five (5) existing culverts in the lower reach of Coal Creek and improvements to the stormwater conveyance systems to ameliorate indirect flooding due to high water conditions in Coal Creek that prevent discharges from the existing stormwater network due to backwater. The subject proposal would not result in a reduction in the flood storage or flood conveyance capacity of Coal Creek and its associated floodplain. The project was designed to meet the performance standards and conditions listed for areas of special flood hazard in LUC 20.25H.180.C.

III. Consistency with Land Use Code Requirements:

A. Land Use and Zoning District Requirements

The proposal is to replace an existing culvert with a bridge structure to improve stream

conditions and reduce the potential for flooding. The site is located in the R-2.5 zoning district. Structural elements proposed with the project are part of the street right-of-way infrastructure and are not subject to residential zoning controls.

B. Uses and Development Allowed within Critical Areas LUC 20.25H.055

The construction of new or expanded culverts and bridges is an allowed use in critical areas or their buffers in section LUC 20.25H.055.B. It must be demonstrated that there is no technically feasible alternative with less impacts on critical areas.

Finding: There is no feasible alternative location for the project given the existing roadway and culvert configuration. The project has incorporated measures to avoid and minimize impacts consistent with the performance standards in LUC 20.25H.055.C.2.

Performance standards for *New or Expanded Bridges and Culverts* (LUC 20.25H.055.C.3.e) require new culverts or bridges to be designed in accordance with the Washington State Department of Fish and Wildlife (WDFW) guidance for fish passage.

Finding: The new bridge structure is consistent with this performance standard. The new structure is designed to comply with the current State Hydraulic Code. The structure is sized according to the Stream Simulation method outlined in Chapter 3 of WDFW's Water Crossing Design Guidelines (Barnard et a. 2013), using the Stream Simulation option. The sizing methodology is described in detail in the technical memo, *Bankfull Width Determination for Lower Coal Creek Culvert Design* (NHC 2016).

Construction staging within the stream buffer is allowed when associated with an allowed use or activity and when temporary impacts have been addressed.

Finding: Construction staging shall be limited to only in areas of the critical area buffer within areas of existing permanent disturbance, including, for example: paved or gravel surface parking areas, access drives, and other similar disturbed areas. **See related conditions of approval in Section IX of this report.**

C. Consistency with Land Use Code Critical Areas Performance Standards

LUC 20.25H.055 – Uses and Development Allowed Within Critical Areas

Repair and replacement of utilities is an allowed use in critical areas and critical areas buffers under LUC 20.25H.055.B. The project must be designed to comply with the specific performance standards applicable to streams and stream buffers and areas of special flood hazard.

Finding: To demonstrate compliance with applicable performance standards, the applicant has submitted a Critical Areas Report which addresses measures to avoid and minimize impacts and the mitigation of impacts.

LUC 20.25H.080.A – Performance Standards – General

Findings: The proposal meets the general performance standards. The project does not include changes to existing street lighting. Stormwater will drain into the existing street catch basin system; the project's new and replaced impervious surface area doesn't meet the thresholds for requiring additional stormwater treatment. The completed culvert replacement project will not

generate noise impacts. The outer edge of the stream buffer will be planted with vegetation to limit human and/or pet intrusion. See Riparian Restoration Plan, Attachment 2. The use of pesticides, insecticides and fertilizer within 150 feet of the stream will be consistent with the City of Bellevue's "Environmental Best Management Practices." **See related conditions of approval in Section IX of this report.**

LUC 20.25H.080.B – Performance Standards – Modification of a Stream Channel

The proposal also includes modification of a stream channel. In accordance with LUC 20.25H.080.B, modification of a stream channel is allowed for a new or expanded utility facility. Proposals to modify a stream channel must be supported by a Critical Areas Report prepared by a qualified professional; including an analysis of technical feasibility and impact avoidance and minimization measures.

Finding: The applicant's consultant has submitted a Critical Areas Report (Parametrix, August 2018) that demonstrates compliance with the technical feasibility and performance standards; including an analysis of technical feasibility and discussion of construction measures taken to minimize impacts to critical areas functions, and a mitigation plan. The Critical Areas Report is included as Attachment 3 to this report.

The project's Critical Areas Report (Parametrix, August 2018) references the design reports for the new bridge structure (*Bankfull Width Determination for Lower Coal Creek Culvert Design*, NHC, 2016) which evaluated the technical feasibility and verified the new structure is designed to comply with the State Hydraulic code for fish passage.

LUC 20.25H.180.C – Development in the Area of Special Flood Hazard – General Performance Standards

The project is part of an overall program (Lower Coal Creek Flood Hazard Reduction Project) to replace all five existing culverts in the lower reach of Coal Creek and construct new stormwater conveyance systems to ameliorate indirect flooding due to high water conditions in Coal Creek that prevent discharges from the existing stormwater network due to the backwater. Details regarding flood occurrence and the associated flood hazard risks are discussed in the *Preliminary Predesign Report* (Tetra Tech 2016) and the *Lower Coal Creek Flood Hazard Reduction Alternatives Analysis* (NHC and Tetra Tech 2015).

Finding: The overall program and the currently proposed culvert replacement project will not result in a reduction in flood storage or flood conveyance capacity of Coal Creek and its associated floodplain. The project is designed to meet the performance standards and conditions for areas of special flood hazard in LUC 20.25H.180.C.

D. Consistency with Critical Areas Report LUC 20.25.230:

As required by LUC 20.25H.055.C.3.d and LUC 20.25H.080.B.2, the applicant has submitted a complete Critical Areas Report (Parametrix, August 2018) which also references supplemental information including: *Bankfull Width Determination for Lower Coal Creek Culvert Design*, NHC 2016, *Preliminary Predesign Report*, Tetra Tech 2016 and the *Lower Coal Creek Flood Hazard Reduction Alternatives Analysis* NHC and Tetra Tech 2015. The reports meet the minimum

requirements in LUC 20.25H.250 and adequately document the project design and mitigation measures. The Critical Areas Report is included as Attachment 3 to this report.

IV. Summary of Technical Reviews

Clearing and Grading:
The Clearing and Grading Division of the Development Services Department has reviewed the proposed culvert replacement for compliance with Clearing and Grading codes and standards. A Clearing and Grading permit will be required to construct the project. Grading codes and standards will be applied to the required clearing and grading permit. **See related conditions of approval in Section IX of this report.**

Land Use:
Noise - The site is adjacent to single-family residences whose residents are most sensitive to disturbance from noise during evening, late night and weekend hours when they are likely to be at home. Construction noise will be limited by the City's Noise Ordinance (Chapter 9.18 BCC) which regulates construction hours and noise levels. **See Conditions of Approval in Section IX of this report**

V. Public Notice and Comment

Application Date:	August 29, 2018
Public Notice (500 feet):	October 4, 2018
Minimum Comment Period:	October 18, 2018

The Notice of Application for this project was published in the City of Bellevue weekly permit bulletin. It was mailed to property owners within 500 feet of the project site.

One comment email was received from Karen Walter with the Muckleshoot Indian Tribe. The comments concerned the project installing rock bands in Coal Creek to stabilize the bed and reduce headcutting. Ms. Walter had previously commented on this issue with the Cascade Key and Newport Key culvert replacements (17-120050-LO) and the design was subsequently revised to remove the courser rock bands. The project narrative for the current application incorrectly retained a reference to the rock bands, however the plans for the Glacier Key culvert replacement indicate removal of the courser rock bands, consistent with Ms. Walter's comments.

VI. State Environmental Policy Act (SEPA)

SEPA environmental review of the entire project was included under Permit #16-145319-LO. The environmental review covered the replacement of the 5 existing culverts with new single-span bridge structures, re-routing of stormwater discharge outfalls and stormwater system improvements. A Determination of Non-Significance (DNS) was issued following State Environmental Policy Act (SEPA) requirements, indicating no probable significant adverse environmental impacts would occur as a result of the proposal. Adverse impacts which are less than significant are usually subject to City Codes or Standards which are intended to mitigate those impacts. There were no appeals of the SEPA Determination.

VII. Decision Criteria

A. Critical Areas Land Use Permit Decision Criteria 20.30P

The Director may approve or approve with modifications an application for a critical areas land use permit if:

1. The proposal obtains all other permits required by the Land Use Code;

Finding: The applicant must obtain approval of a Clearing and Grading permit prior to commencing any work. **See related condition of approval in Section IX below.**

2. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer;

Finding: The new bridge structure will simulate the natural stream dimensions, allowing sediment and debris to pass through and providing fish unhindered passage beneath the roadway. The new structures will be designed to comply with the current State Hydraulic Code. The proposed culvert replacement structures were sized according to the Stream Simulation method outlined in Chapter 3 of WDFW's Water Crossing Design Guidelines (Barnard et al. 2013), using the Stream Simulation option. The applicant has also provided discussion in the Critical Areas Report detailing the measures to minimize impacts to critical areas. The proposal incorporates the best available construction and design techniques to minimize impacts to the critical area and critical area buffer.

3. The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable, and ;

Finding: As discussed above, the proposed facility has been designed to comply with applicable performance standards for utility systems located within or adjacent to streams, and in areas of special flood hazard.

4. The proposal will be served by adequate public facilities including street, fire protection, and utilities; and;

Finding: This is a proposal to replace an existing culvert with a bridge structure. Adequate public facilities are available to the site.

5. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210; and

Finding: A stream buffer restoration plan has been prepared in accordance with the requirements of LUC 20.25H.210, the Riparian Restoration Plan is included as Attachment 2. The Critical Areas Report (Attachment 3) includes a maintenance and monitoring plan. **See related condition of approval in Section IX below.**

6. The proposal complies with other applicable requirements of this code.

Finding: As discussed above, the proposal complies with all other applicable requirements of the Land Use Code.

B. Critical Areas Report Decision Criteria- General Criteria LUC 20.25H.255

The Director may approve, or approve with modifications, the proposed modification where the applicant demonstrates:

1. The modifications and performance standards included in the proposal lead to levels of protection of critical area functions and values at least as protective as application of the regulations and standards of this code;

Finding: The Critical Areas Report submitted with the proposal demonstrates that the proposed modifications will be at least as protective of the critical area functions and values as with the strict application of the regulations and standards of the Land Use Code.

2. Adequate resources to ensure completion of any required mitigation and monitoring efforts;

Finding: The project is owned and managed by the City of Bellevue Utilities Department. They have adequate resources to satisfactorily complete the project and to comply with the mitigation and monitoring required.

3. The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical area and critical area buffers off-site; and

Finding: The impacts of the proposed culvert replacement have been adequately minimized and mitigated so that modifications will not be detrimental to critical area/buffers functions and values. The applicant has prepared a Critical Areas Report that includes an analysis of critical functions, impacts and mitigation measures. The proposed mitigation measures include stream buffer restoration; planting native-specie vegetation to increase plant diversity and density, and to reduce stream bank erosion and improve stream habitat.

4. The resulting development is compatible with other uses and development in the same land use district.

Finding: The proposal is to replace an existing culvert with a new bridge structure. No changes to land uses are proposed and the proposal is compatible with other uses and development in the vicinity.

VIII. Conclusion and Decision

After conducting the various administrative reviews associated with this proposal, including consistency with Land Use Code, SEPA, City Code and Standard compliance reviews, the Director of the Development Services Department does hereby **approve with conditions** the proposal to replace the existing Glacier Key culvert with a bridge structure where Coal Creek is crossed by Glacier Key.

A SEPA Determination of Non-significance was issued for the total project proposal under Permit #16-145319-LO. Separate critical areas are required for the additional culverts and outfalls.

Note- Expiration of Approval: In accordance with LUC 20.30P.150 a Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a Clearing and Grading Permit or other necessary development permits within one year of the effective date of the approval.

IX. Conditions of Approval

The applicant shall comply with all applicable Bellevue City Codes and Ordinances including but not limited to:

Applicable Ordinances	Contact Person
Clearing and Grading Code- BCC 23.76	Janney Gwo, 425-452-6190
Land Use Code- BCC 20.25H	Peter Rosen, 425-452-5210
Noise Control- BCC 9.18	Peter Rosen, 425-452-5210

The following conditions are imposed under the Bellevue City Code:

1. **Clearing and Grading Permit Required:** Approval of this Critical Areas Land Use Permit does not constitute an approval of any development permit. An application for a clearing and grading permit must be submitted and approved before construction can begin. Plans submitted as part of any permit application shall be consistent with the activity permitted under this approval.

   Authority: Land Use Code 20.30P.140
   Clearing & Grading Code 23.76.035

   Reviewer: Janney Gwo, Clearing & Grading Section

2. **Construction Staging:** Construction staging is authorized only in areas of the critical area buffer with existing permanent disturbance, including; paved or gravel surface parking areas, access drives, and other similar disturbed areas.

   Authority: Land Use Code 20.25H.055
   Reviewer: Peter Rosen, Land Use

3. **Mitigation Plan Installation:** A mitigation plan for all areas of permanent new disturbance and temporary disturbance is required to be submitted for review and approval by the City of Bellevue prior to issuance of the required construction permit. The plans shall be consistent with the Riparian Restoration Plan (Attachment 2) approved with this application. The mitigation planting shall be installed within one year of culvert replacement.

   Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
   Reviewer: Peter Rosen, Land Use

4. **Mitigation, Maintenance, and Monitoring Plan:** The Critical Areas Report (Parametrix, August 2018) includes performance standards to monitor success of the mitigation planting, a monitoring schedule, contingency plan and maintenance/adaptive management. This information shall be included with the mitigation plans submitted with construction permits. The following performance standards apply for the 5-year monitoring period following

installation:

Year 1:

- 100% survival of all installed plants, including replacements installed during the warranty period.
- 5% Non-Regulated and Non-regulated Class A, B, or C noxious weeds
- No (0%) Regulated Class A, B, or C noxious weeds as identified on the King County Noxious Weed List.

Year 2:

- Greater than 40% cover of installed and volunteer native plants within the landscape restoration areas.
- No (0%) Regulated Class A, B, or C noxious weeds
- Less than 5% cover of non-regulated Class A, B, or C noxious weeds.

Year 3:

- Greater than 60% cover of installed and volunteer native plants within the landscape restoration areas.
- No (0%) Regulated Class A, B, or C noxious weeds
- Less than 10% cover of non-regulated Class A, B, or C noxious weeds.

Year 4:

- Greater than 75% cover of installed and volunteer native plants within the landscape restoration areas.
- No (0%) Regulated Class A, B, or C noxious weeds
- Less than 15% cover of non-regulated Class A, B, or C noxious weeds.

Year 5:

- Greater than 80% cover of installed and volunteer native plants within the landscape restoration areas.
- No (0%) Regulated Class A, B, or C noxious weeds
- Less than 15% cover of non-regulated Class A, B, or C noxious weeds.

Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Peter Rosen, Land Use

5. **Submittal of Mitigation Maintenance and Monitoring Reports:** As part of the required 5 years of mitigation maintenance and monitoring, the applicant shall submit annual monitoring reports to the Development Services Department Land Use Division at the end of the growing

season by no later than the end of the calendar year.

Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Peter Rosen, Land Use

6. **Applicable State and Federal Permits:** To mitigate adverse impacts, Federal and State water quality standards shall be met. All required Federal and State permits and approvals must be received by the applicant prior to the commencement of any work. A copy of the approved State and Federal permits shall be submitted to the City of Bellevue Development Services Department Land Use Division prior to issuance of construction permits.

Authority: Land Use Code 20.25H.055.C.3.d
Reviewer: Peter Rosen, Development Services Department

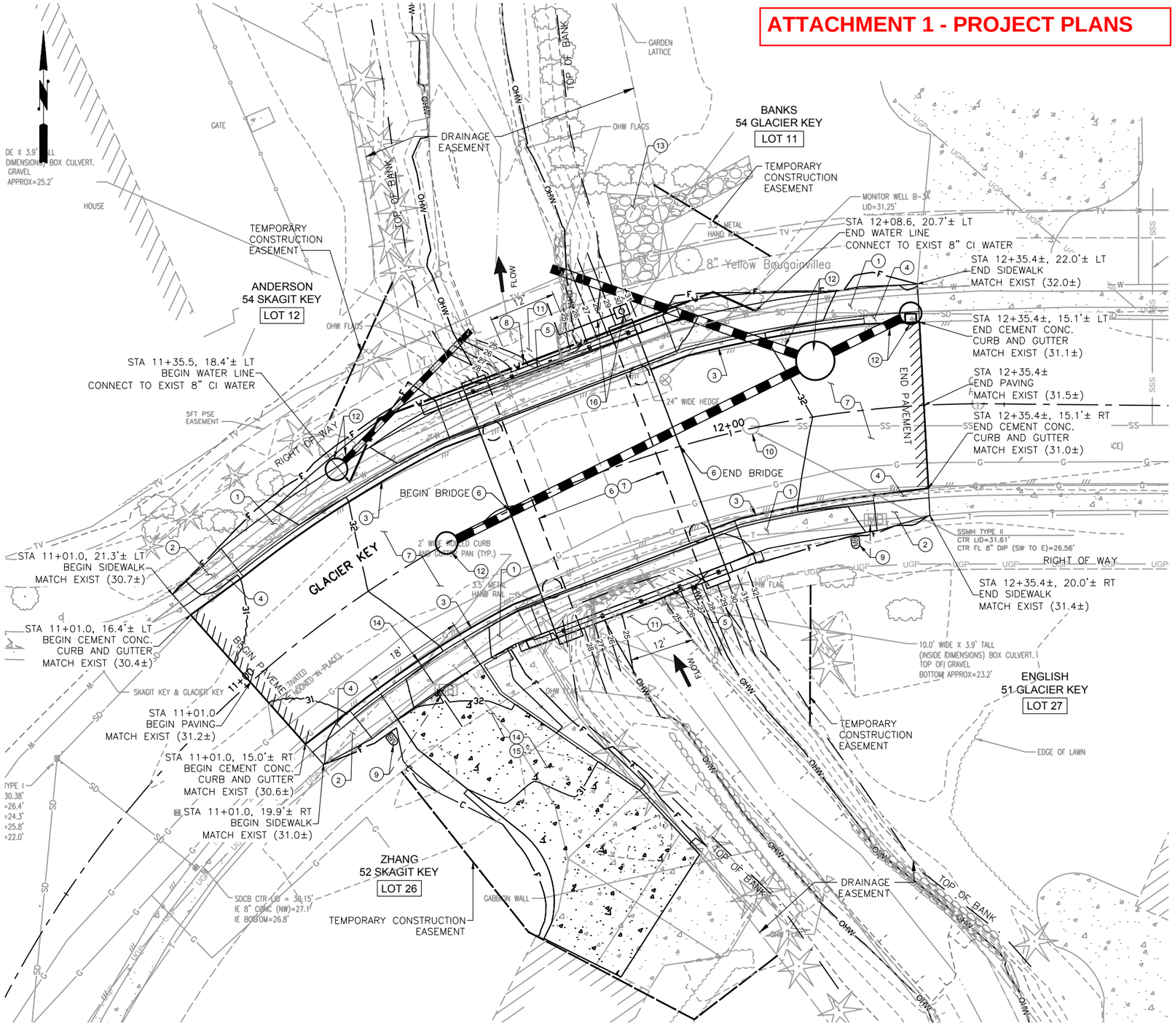
7. **In-Water Work Window:** To prevent damage or disturbance to threatened fish species, work in the active channel approved by the underlying clearing and grading permit must be completed during an in-water work window of July 1 to August 31 unless an exception has been granted in writing by the Washington Department of Fish and Wildlife.

Authority: Land Use Code 20.25H.160
Reviewer: Peter Rosen, Land Use

8. **Pesticides, Insecticides, and Fertilizers:** The applicant must submit as part of the required Clearing and Grading Permit information regarding the use of pesticides, insecticides, and fertilizers in accordance with the City of Bellevue's "Environmental Best Management Practices".

Authority: Land Use Code 20.25H.220.H
Reviewer: Peter Rosen, Land Use

ATTACHMENT 1 - PROJECT PLANS



CONSTRUCTION NOTES:

1. CEMENT CONCRETE SIDEWALK, SEE COB STD DETAIL SW-110-1/G-C5.
2. TAPER CEMENT CONCRETE SIDEWALK TO MATCH EXIST. TAPER LENGTH = 10 FT
3. CEMENT CONCRETE TRAFFIC CURB AND GUTTER, SEE COB STD DETAIL SW-100-1/G-C5.
4. TRANSITION ROLLED CURB TO CEMENT CONCRETE TRAFFIC CURB AND GUTTER, SEE 2/G-C5.
5. BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET G-B11.
6. BRIDGE, SEE SHEETS G-B1 TO G-B14. STA 11+57.43 TO STA 11+90.57.
7. SEE TYPICAL ROADWAY APPROACH AND BRIDGE SECTION FOR PAVING, 1/G-C4 AND 3/G-C4.
8. ATTACH WATER MAIN TO BRIDGE. SEE SHEET G-C3 FOR WATER MAIN PROFILE. SEE A/G-B10 FOR WATER MAIN SUPPORTS ON BRIDGE.
9. RELOCATED MAILBOX
10. RAISE SANITARY SEWER MANHOLE TO GRADE. INSTALL 48" DIA. SECTION. SEE G-C2 FOR ELEVATION.
11. SEE SHEET G-H1 FOR CHANNEL GRADING.
12. SEE ROAD PROFILE, G-C2, FOR STORM DRAIN. SEE ALSO GENERAL NOTE 6.
13. REPLACE EXIST FLAGSTONE PATIO AFTER BRIDGE/ROAD CONSTRUCTION IS COMPLETE.
14. CEMENT CONCRETE DRIVEWAY SEE 2/G-C3
15. MAINTAIN DRIVEWAY ACCESS DURING CONSTRUCTION. INSTALL TEMPORARY GRAVEL DRIVEWAY.
16. STREAM GAUGE MONITORING STATION. ENCLOSURE, INLET PIPE, STILLING WELL, AND FOUNDATION. SEE 3/G-C3.

GENERAL NOTES

1. SEE SHEET G2 AND G3 FOR GENERAL, WATER, STORM DRAINAGE, SEWER AND TRANSPORTATION NOTES.
2. SEE SHEET G-EC1 FOR ROAD ALIGNMENT AND STORM DRAIN PROFILE.
3. SEE WATER MAIN PROFILE, SHEET G-C3 FOR JOINT RESTRAINTS AND HORIZONTAL THRUST BLOCKS.
4. CONTRACTOR TO RELOCATE WATER LINE.
5. RELOCATION OF TELEPHONE (CENTURYLINK), UNDERGROUND POWER (PSE), CABLE (COMCAST), AND GAS (PSE) BY OTHERS.
6. TRENCHING FOR STORM DRAIN PER COB STD DETAIL D-25.

PAVING NOTES

1. PAVING LIMITS FOR FRANCHISE UTILITY TRENCHING, EXPOSING EXIST WATER PIPE FOR JOINT RESTRAINT, OR STORM CATCH BASIN INSTALLATION MAY BE ADJUSTED BY THE TRANSPORTATION INSPECTOR BASED ON FIELD CONDITIONS.
2. ANY DAMAGE TO THE ROADWAY CAUSED DURING CONSTRUCTION MUST BE RESTORED AT THE DIRECTION OF THE TRANSPORTATION INSPECTOR.

GRADING NOTE

ROADWAY GRADING LIMITS SHOWN BY CUT OR FILL LINE. SEE SHEET G-C2 FOR ROAD PROFILE. SEE SHEET G-H1 FOR CHANNEL GRADING.

DATUM
NAVD 88

0 5 10 15 20
SCALE IN FEET

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS

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DRAWN BY	DATE
GG	
CHECKED BY	DATE

City of Bellevue
UTILITIES

FLOOD HAZARD REDUCTION PROJECT
GLACIER KEY
ROAD PLAN

G-C1 | SHT 8 OF 55

CONSTRUCTION NOTES:

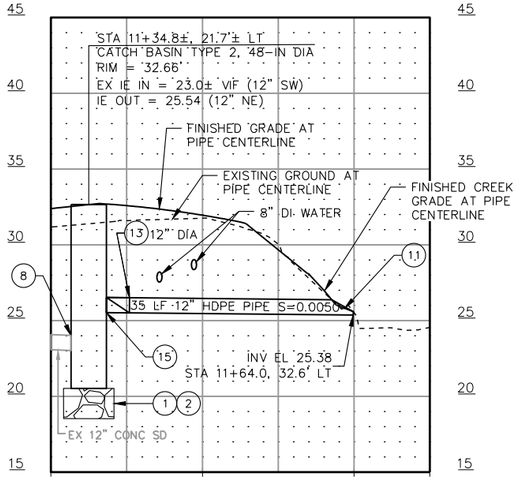
1. STRUCTURE FOUNDATION MATERIAL SHALL BE 2" MIN. CSBC LEVELING COURSE OVER 2 FT THICK, 4" QUARRY SPALLS WRAPPED IN NONWOVEN GEOTEXTILE FOR SEPARATION OVER GEOSYTHETIC REINFORCEMENT GRID. STRUCTURE FOUNDATION MATERIAL MIN. 12" BEYOND OUTSIDE DIA.
2. ACTIVE SUPPORT OF EXCAVATION AND DEWATERING, WITH GROUNDWATER CUTOFF WILL BE REQUIRED FOR INSTALLATION OF SIPHON AND ASSOCIATED STRUCTURES. CONTRACTOR TO COORDINATE SIPHON CONSTRUCTION WITH BRIDGE AND STREAM BYPASS WORK. CONTRACTOR SHALL SUBMIT AN EXCAVATION SUPPORT AND DEWATERING PLAN PER THE CONTRACT SPECIFICATIONS.
3. SEE G-B1 TO G-B14 FOR BRIDGE.
4. SEE H/G-H2 FOR CREEK SECTION UNDER BRIDGE.
5. RAISE SANITARY SEWER MANHOLE TO GRADE. INSTALL 48" DIA. MANHOLE SECTION.
6. SEE SHEET G-SP1 FOR EXIST CULVERT REMOVAL
7. PIPE BEDDING FOR FLEXIBLE PIPE PER COB STD DTL D-46 WITH SPECIAL FOUNDATION MATERIAL OF 2 FT THICK, 4" QUARRY SPALLS WRAPPED IN NONWOVEN GEOTEXTILE FOR SEPARATION OVER GEOSYTHETIC REINFORCEMENT GRID. FULL LENGTH BETWEEN CATCH BASINS.
8. CONNECT EXISTING PIPE TO TYPE-2 CATCH BASIN.
9. TYPE-2 CATCH BASIN PER COB STD DETAIL D-4 WITH MANHOLE RING AND COVER PER COB STD DETAIL D-21.
10. PROVIDE KNOCKOUT ON OPPOSITE WALL OF CB FROM INLET PIPE AT SAME EL 24.76' FOR 18" FUTURE CONNECTION.
11. VERIFY POSITIVE SLOPE TO CREEK (0.5% MIN.) PRIOR TO OUTLET PIPE INSTALLATION. OUTLET PIPE WITH BEVEL TO MATCH CREEK SIDE SLOPE PER COB STD DETAIL D-34.
12. THE CONTRACTOR SHALL RELOCATE ANY SANITARY OR WATER SERVICE CONNECTION CROSSINGS IF IN CONFLICT WITH THE PROPOSED STORM SYSTEM.
13. "CHECKMATE" AS MANUFACTURED BY TIDEFLEX OR APPROVED EQUAL. INSTALL PER MANUFACTURERS' RECOMMENDATIONS, SEE CONTRACT SPECIFICATION SECTION 7-11.
14. PROVIDE TEMPORARY PLUG ON 18" SIPHON PIPE.
15. KOR-N-SEAL FLEXIBLE PIPE TO MANHOLE CONNECTOR.
16. INSTALL EPDM PAD, 1/4" THICK MIN. BETWEEN OUTSIDE EDGE OF BRIDGE WINGWALL AND SIDE OF STORM PIPE. ADVANTEK FRP BY ADVANTAGE INDUSTRIAL SOLUTIONS OR APPROVED EQUAL.
17. FRANCISE UTILITY DESIGN TO BE SHOWN IN FUTURE SUBMITTAL.

VERTICAL CURVE DATA TABLE

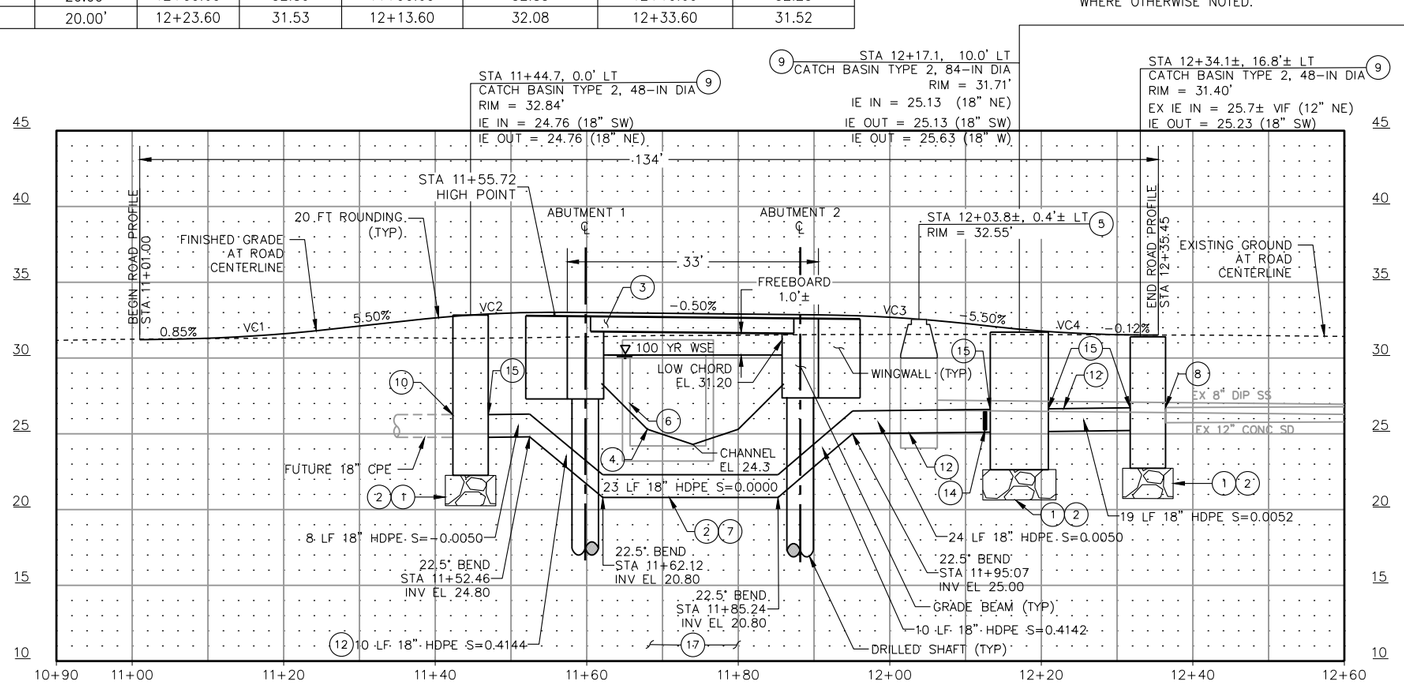
CURVE #	LENGTH	PVI STA	PVI ELEV	BEGIN VC STA	BEGIN VC ELEV	END VC STA	END VC ELEV
VC1	20.00'	11+16.00	31.34	11+06.00	31.25	11+26.00	31.89
VC2	20.00'	11+47.40	33.07	11+37.40	32.52	11+57.40	33.02
VC3	20.00'	12+00.60	32.80	11+90.60	32.85	12+10.60	32.25
VC4	20.00'	12+23.60	31.53	12+13.60	32.08	12+33.60	31.52

STATION/OFFSET NOTE:

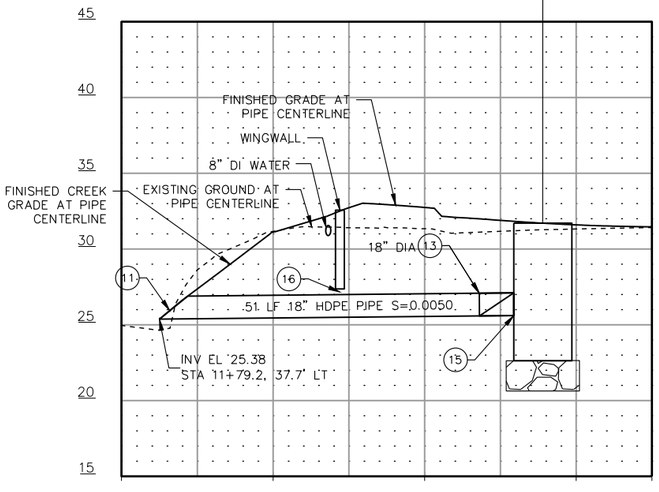
1. ALL STATIONS ARE ROAD ALIGNMENT STATIONS UNLESS OTHERWISE NOTED.
2. STATIONS AND OFFSETS ARE SHOWN TO CENTER OF STRUCTURE, EXCEPT WHERE OTHERWISE NOTED.



OUTFALL PROFILE 1
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



ROAD PROFILE GLACIER KEY ROAD CENTERLINE
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



OUTFALL PROFILE 2
SCALE: HORIZ: 1"= 10' VERT: 1"=5'

NAVD 88

0 5 10 15 20
SCALE IN FEET

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS

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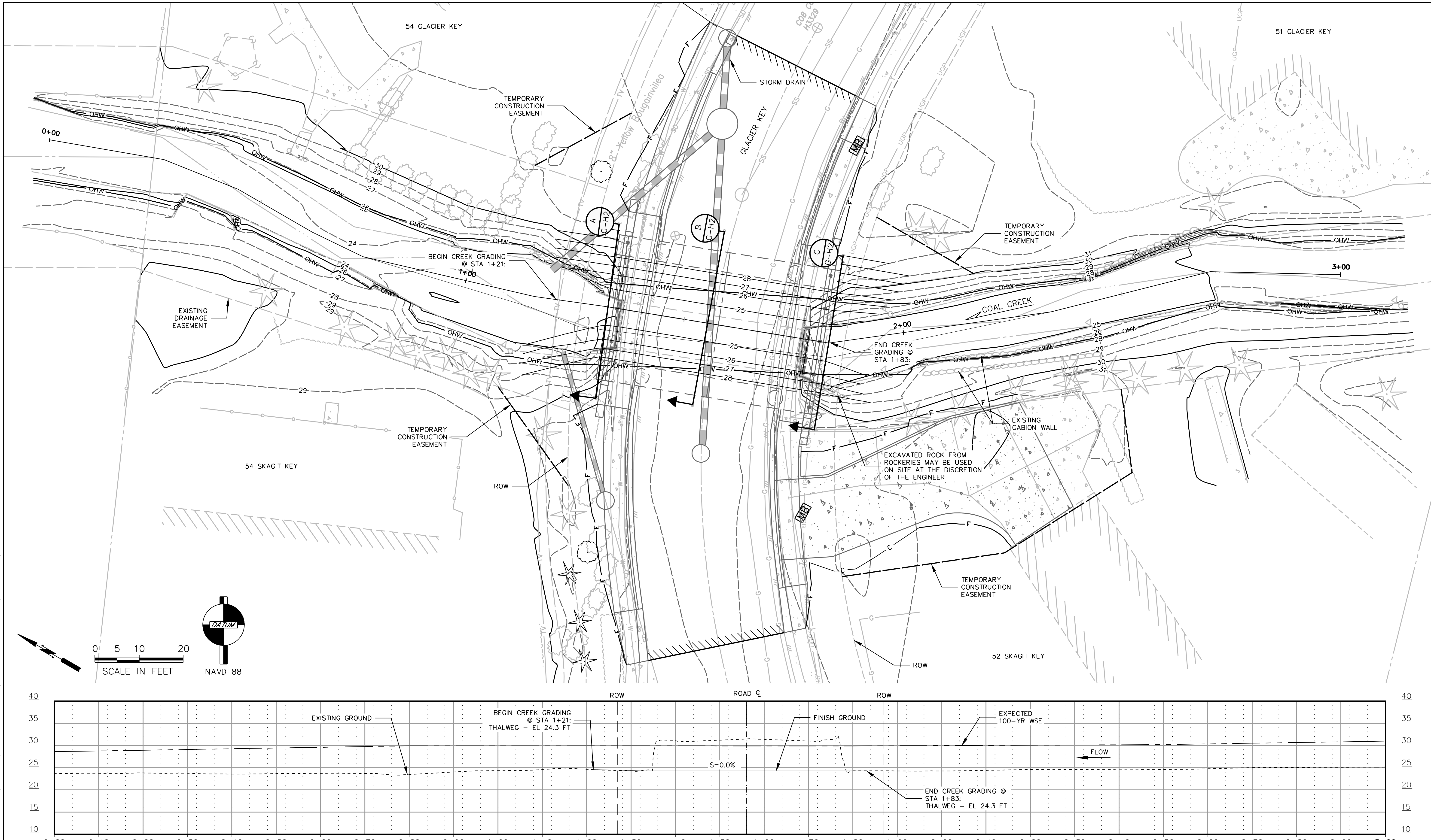
KA DESIGNED BY DATE
NS DRAWN BY DATE
GG CHECKED BY DATE

City of Bellevue UTILITIES

FLOOD HAZARD REDUCTION PROJECT
GLACIER KEY
ROAD PROFILE

G-C2 | SHT 9 OF 55

Path: P:\134271 Lower Coal Creek Ph 2 Early Action\05 G3 Design\CAD\Sheet Files\9 G-C2_GLACIER KEY ROAD PROFILE.dwg Plot date: Sep 26, 2018-11:08:02am CAD User: nadine.stock.
Xref Filename: | G3-border | C-SP-ALGN-PROF |



60% SUBMITTAL

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Xref Filename: | BellevueBorder | C-SP-G3-EASEMENTS | C-SP-OHW | C-SP-SITE-GLACIER KEY | C-SP-SITE-SKAGIT KEY-LOWER | V-XE-SITE-G3 |

NO	DATE	BY	APPR	REVISIONS

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PROJECT MANAGER DATE

D. HINTON
DESIGNED BY DATE
M. OHRT
DRAWN BY DATE
E. ROWLAND
CHECKED BY DATE

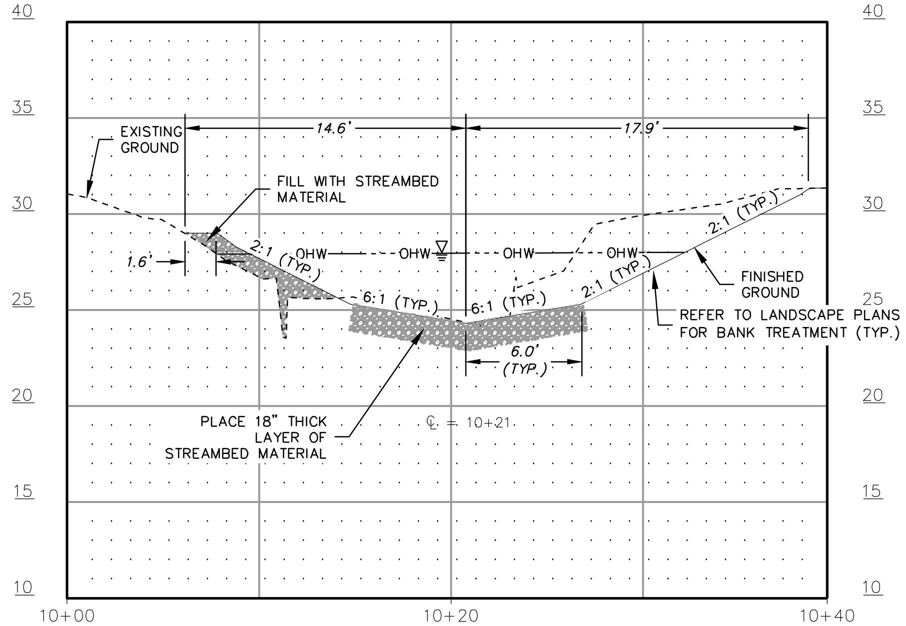
City of Bellevue UTILITIES

FLOOD HAZARD REDUCTION PROJECT

GLACIER KEY HABITAT CREEK GRADING PLAN & PROFILE

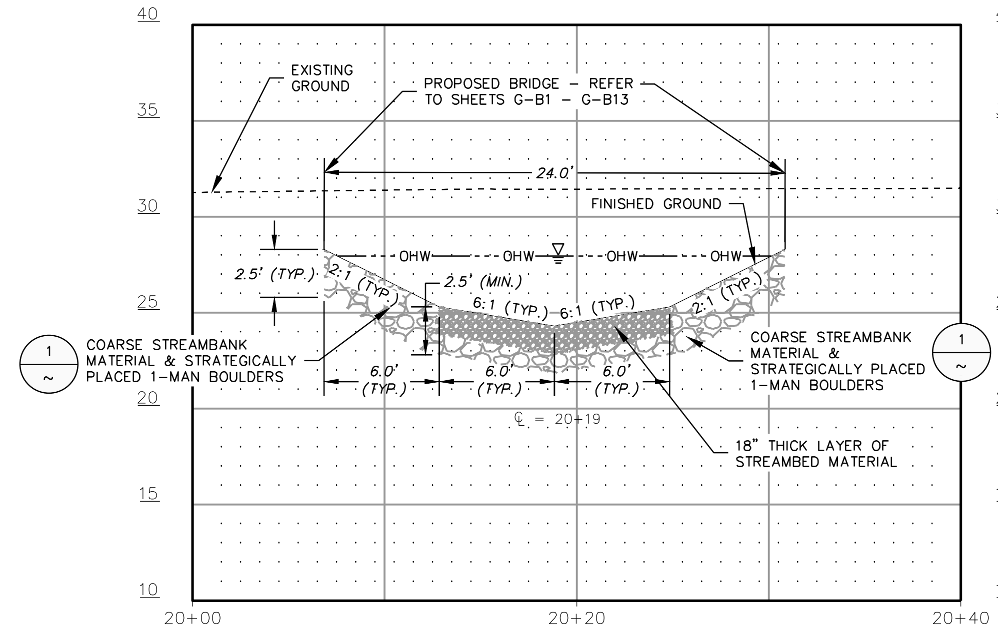
G-H1

SHT 13 OF 55



SECTION STA. 1+33

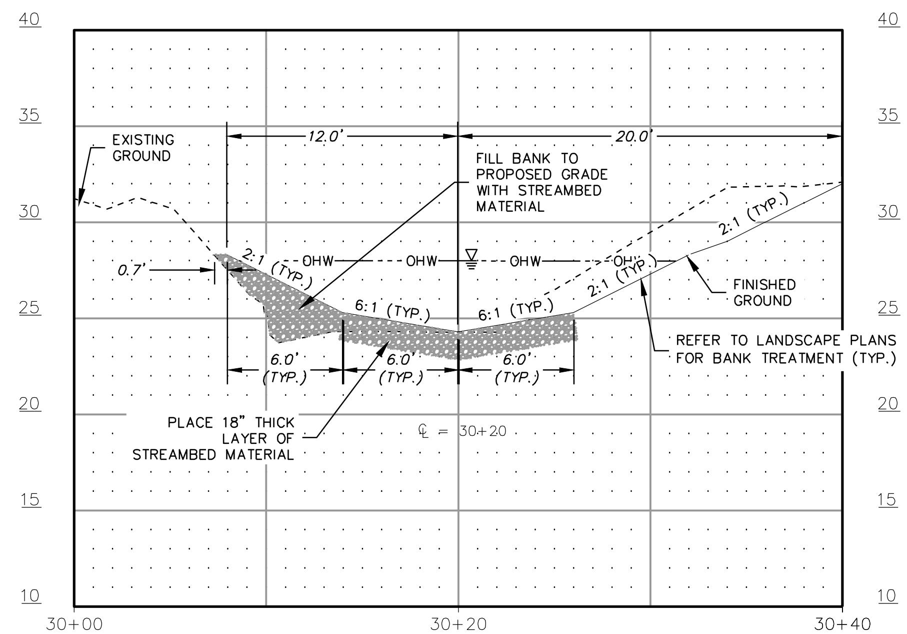
1" = 5' (HORIZ.) 1" = 5' (VERT.) — A / G-H1



SECTION STA. 1+55

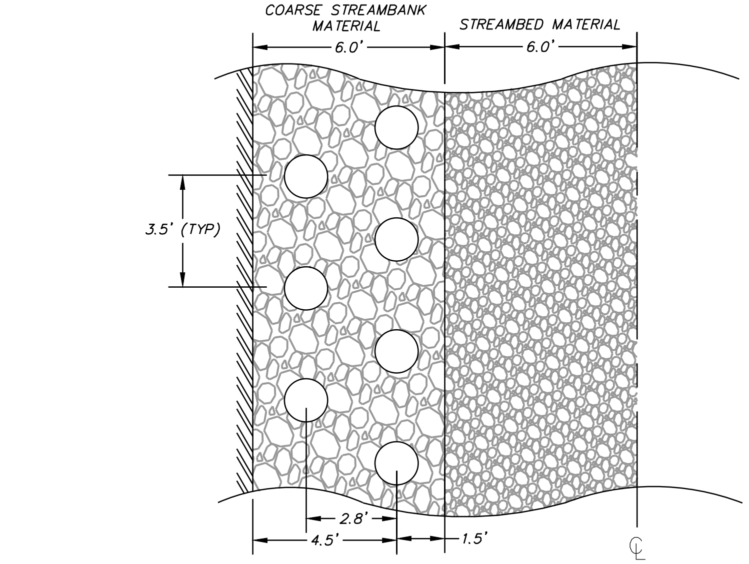
1" = 5' (HORIZ.) 1" = 5' (VERT.) — B / G-H1

NOTE:
1. SECTIONS RELATE TO THE FOLLOWING STATIONS
   - SECTION A: STA. 1+18 TO 1+32 (FACE OF BRIDGE)
   - SECTION B: 1+32 TO 1+82 (FACE OF BRIDGE)
   - SECTION C: 1+82 TO 2+03
2. ALL PORTIONS OF THE CREEK BED AND BANKS REQUIRING EXCAVATION SHALL BE OVER-EXCAVATED BY 12 INCHES AND FILLED WITH STREAMBED GRAVEL

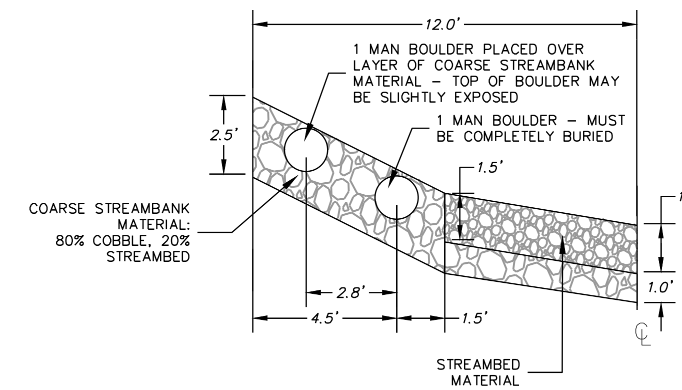


SECTION STA. 1+83

1" = 5' (HORIZ.) 1" = 5' (VERT.) — C / G-H1



NOTE:
DETAIL APPLIES EQUALLY TO LEFT AND RIGHT BANKS



COARSE STREAMBANK MATERIAL DETAIL

1"= 3'-0" — S-H2, 1 / ~

DATUM
NAVD 88

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DESIGN MANAGER — DATE

PROJECT MANAGER — DATE

D. HINTON — DESIGNED BY — DATE
M. OHRT — DRAWN BY — DATE
E. ROWLAND — CHECKED BY — DATE

City of Bellevue UTILITIES

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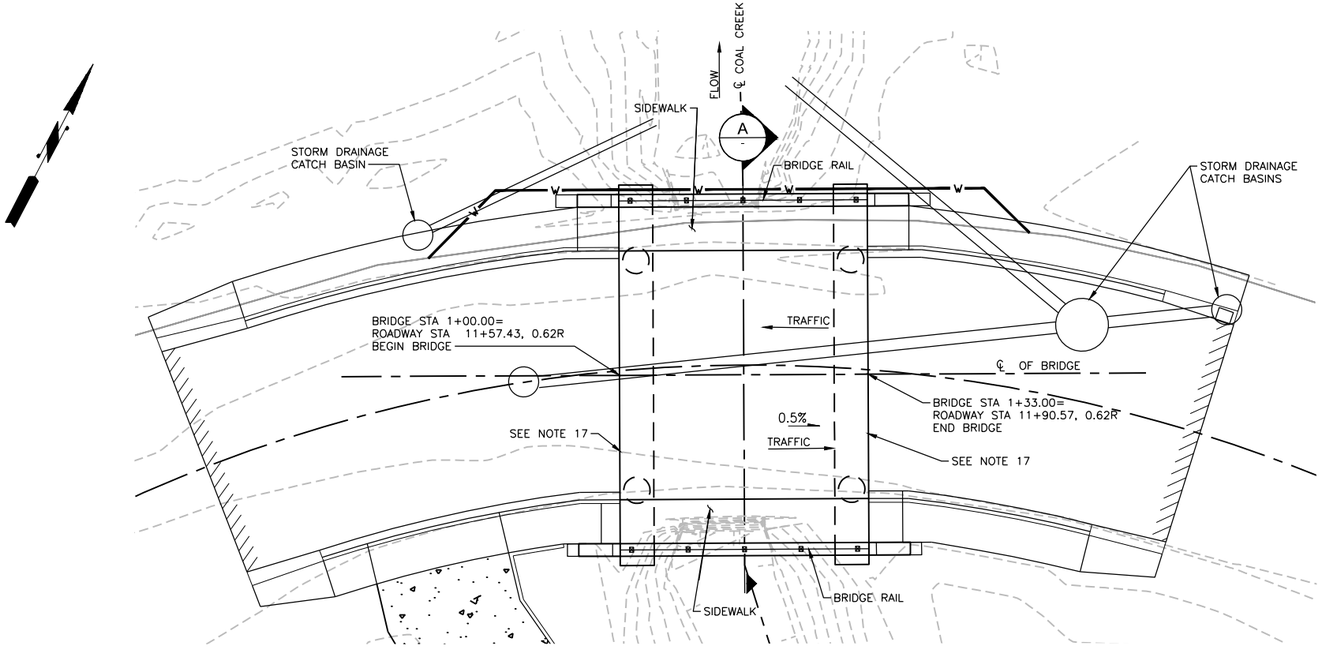
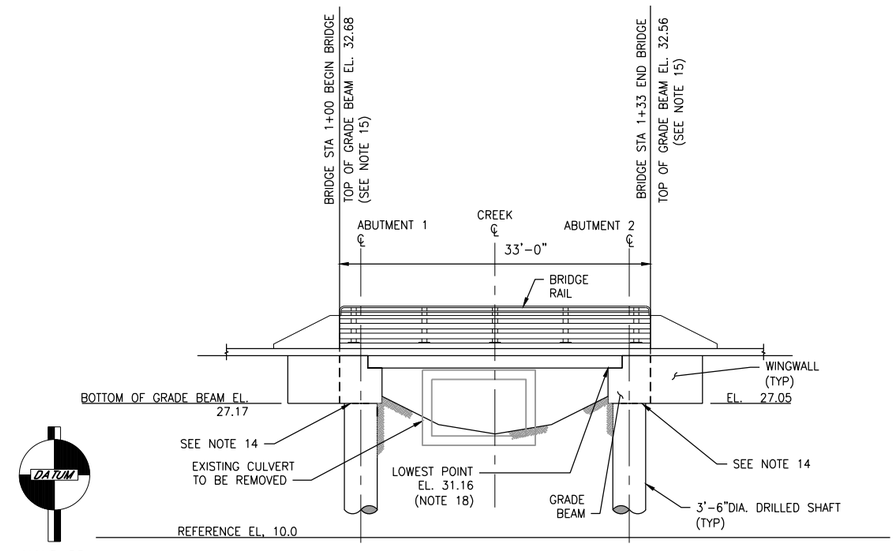
FLOOD HAZARD REDUCTION PROJECT

GLACIER KEY CREEK GRADING SECTION VIEWS

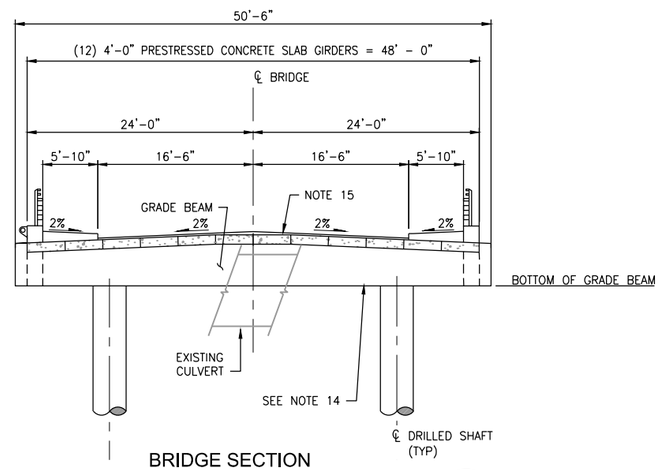
G-H2 — SHT 14 OF 55



PLAN
SCALE: 1" = 10'



ELEVATION
SCALE: 1/8" = 1'-0"



BRIDGE SECTION
(LOOKING AT ABUTMENT)
SCALE : 1/8"=1'-0"

GENERAL NOTES:

1. ALL MATERIALS AND WORKMANSHIP FOR STRUCTURAL ELEMENTS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, DATED 2018 AND AMENDMENTS.
2. THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SEVENTH EDITION – 2017, MODIFIED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL.
3. SEISMIC DESIGN HAS BEEN DONE USING THE FOLLOWING SEISMIC PARAMETERS:

SEISMIC DESIGN PARAMETERS	
(Fa)(Ss)=SDs	(0.93)(0.98)=0.91
(Fv)(S1)=SD1	(2.70)(0.33)=0.89
Site Class	E
Site Adjusted PGA, As	0.4

4. BRIDGE RAIL AND ANCHORAGE PROVIDED HAS BEEN CRASH TESTED TO MEET NCHRP 350 TL-4 REQUIREMENTS. CONCRETE REINFORCEMENT IS DETAILED FOR TL-1 PER PROJECT REQUIREMENTS.
5. CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:

   DRILLED SHAFT.....CLASS 5,000P
   ALL CAST-IN-PLACE.....CLASS 4000
   PRE-STRESSED CONCRETE SLAB GIRDER.....7000 PSI AT 28 DAYS
   .....6000 PSI AT PRE-STRESSED RELEASED
   GROUT.....5000 PSI (SEE SPECIFICATIONS)
6. GRADE BEAM CONCRETE SHALL BE 3,000 PSI PRIOR TO PLACING PRECAST CONCRETE PANELS.
7. UNLESS OTHERWISE SHOWN ON THE PLANS, THE CONCRETE COVER MEASURED FROM THE FACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING BAR SHALL BE AS FOLLOWS:

TOP OF ROADWAY SLAB	2 INCHES
BOTTOM OF ROADWAY SLAB	1-½ INCHES
CONCRETE CAST AGAINST EARTH	3 INCHES
CONCRETE EXPOSED TO EARTH OR WEATHER	
PRIMARY REINFORCEMENT	2 INCHES
SECONDARY REINFORCEMENT (TIES OR STIRRUPS)	1-½ INCHES

8. UNLESS OTHERWISE SHOWN ON THE PLANS, ALL EXTERIOR CORNERS AND EDGES SHALL HAVE ¾" CHAMFER.
9. THE UTILITY CENTERLINES ARE SHOWN FOR REFERENCE ONLY. THE CONTRACTOR SHALL COORDINATE THESE PLANS WITH RELEVANT UTILITY INFORMATION SHOWN ON SHEETS G-C2 AND G-C3.
10. A PIGMENT SEALER SHALL BE APPLIED TO THE EXTERIOR SURFACE OF THE GRADE BEAM, WING WALL, BRIDGE RAIL TERMINAL EXTERIOR, PRESTRESSED CONCRETE SLAB GIRDERS AND THE BRIDGE RAIL PEDESTAL CONCRETE. THE COLOR SHALL BE MT. ST. HELENS GRAY.
11. [XXX] INDICATES BAR MARK NUMBER.
12. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A706 GRADE 60.
13. (E) INDICATES EPOXY COATED BAR.
14. EXCAVATE 6" BELOW GRADE BEAM AND WINGWALL BOTTOM ELEVATION. PLACE 6" CSBC FULL WIDTH AND LENGTH OF GRADE BEAM AND WINGWALL.
15. PROVIDED ELEVATION IS TO TOP OF CONCRETE AT THE CENTERLINE OF BRIDGE. FOR ROADWAY PROFILE SEE SHEET G-C2. SEE SHEET G-C4 FOR TYPICAL CROSS SECTIONS.
16. BRIDGE IS SYMMETRICAL ABOUT BRIDGE CENTERLINE. SEE SHEET G-EC1 FOR ROADWAY ALIGNMENT DATA.
17. PLACE STRUCTURAL BACKFILL 12" LATERALLY FROM GRADE BEAM PER CONTRACT SPECS.
18. LOWEST POINT APPLIES TO GIRDERS 1 & 12.

12" PRESTRESSED CONCRETE SLAB GIRDERS
LOADING: HL-93

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS

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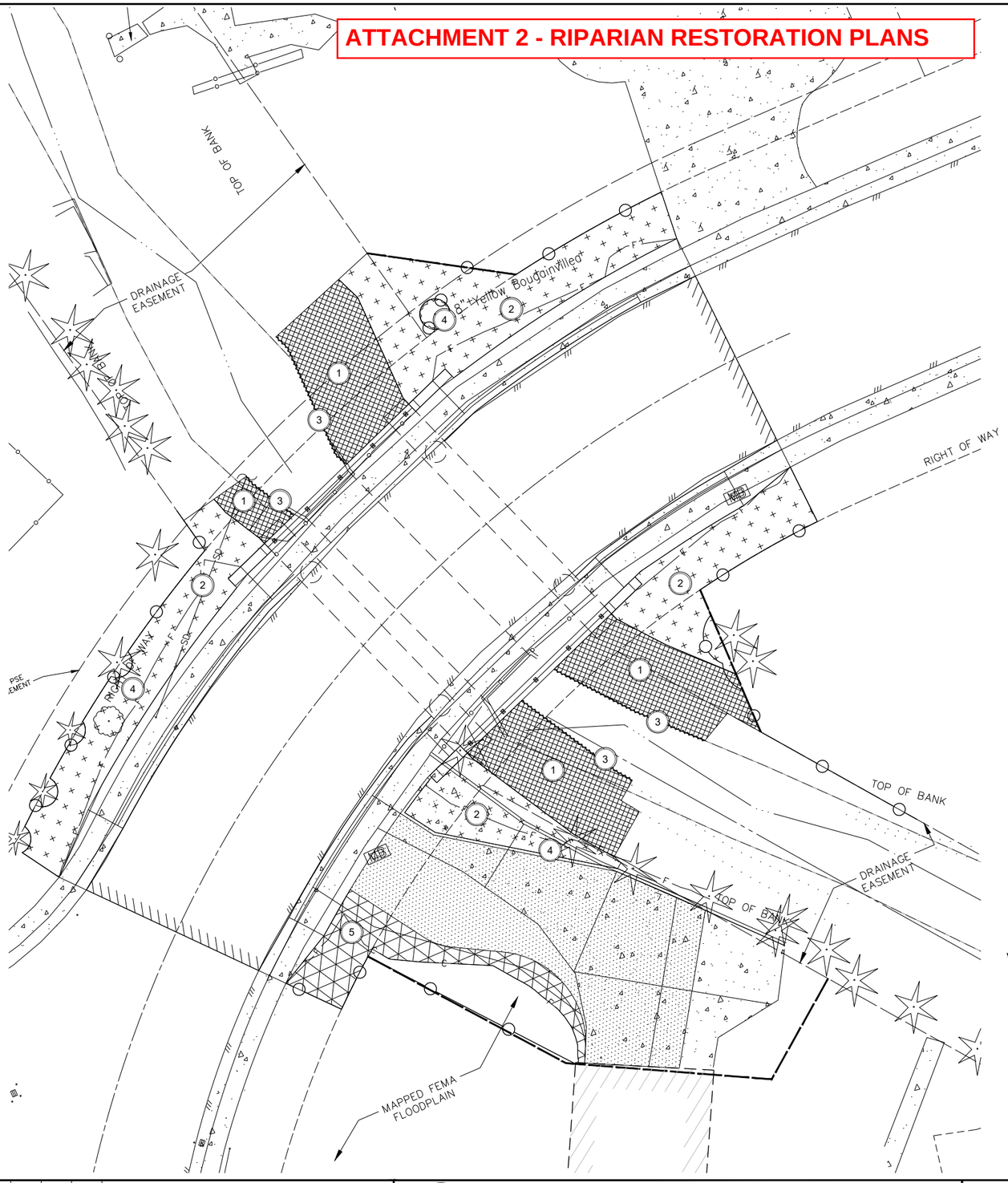
ACF DRAWN BY DATE
GG CHECKED BY DATE

City of Bellevue
UTILITIES

FLOOD HAZARD REDUCTION PROJECT
GLACIER KEY BRIDGE LAYOUT AND GENERAL NOTES

G-B1 | SHT 15 OF 55

ATTACHMENT 2 - RIPARIAN RESTORATION PLANS



PLANTING LEGEND AND MATERIALS LIST:

	SCIENTIFIC NAME	COMMON NAME	QTY	MIN SIZE / CONDITION	SPACING	NOTES
	TREES					
	ACER CIRCINATUM	VINE MAPLE	x	3/4" CAL / #5 CONT	Per Plan	SEE DETAIL 4/C-L2
	ACER MACROPHYLLUM	BIG LEAF MAPLE	x	3/4" CAL / #5 CONT	Per Plan	
	CORYLUS CORNUTA	BEAKED HAZELNUT	x	3/4" CAL / #5 CONT	Per Plan	
	PSEUDOTSUGA MENZIESII	DOUGLAS-FIR	x	4' TALL / #5 CONT	Per Plan	
	THUJA PLICATA	WESTERN RED CEDAR	x	4' TALL / #5 CONT	Per Plan	
	ZONE 1 PLANTINGS					
	CORNUS SERICEA	RED OSIER DOGWOOD	184	30" x 1/2" / LIVESTAKE	18" OC	SEE DETAIL 1/C-L2
	SALIX HOOKERIANA	HOOKER'S WILLOW	183	30" x 1/2" / LIVESTAKE	18" OC	
	SALIX SITCHENSIS	SITKA WILLOW	183	30" x 1/2" / LIVESTAKE	18" OC	
	ZONE 2 PLANTINGS					
	CORNUS SERICEA	RED OSIER DOGWOOD	37	12" / #1 CONT	3' OC	SEE DETAIL 2/C-L2
	HOLODISCUS DISCOLOR	OCEANSPRAY	21	12" / #1 CONT	3' OC	
	PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	21	12" / #1 CONT	3' OC	
	ROSA PISOCARPA	CLUSTERED WILD ROSE	37	12" / #1 CONT	3' OC	
	RUBUS SPECTABILIS	SALMONBERRY	37	12" / #1 CONT	3' OC	
	SYMPHORICARPOS ALBUS	SNOWBERRY	37	12" / #1 CONT	3' OC	
	GAULTHERIA SHALLON	SALAL	21	12" / #1 CONT	3' OC	
	VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	21	24" / #2 CONT	3' OC	
	COIR LOG PLANTINGS					
	SALIX SITCHENSIS	SITKA WILLOW	28	30" x 1/2" / LIVESTAKE	1' OC	SEE DETAIL 3/C-L2
	CORNUS SERICEA	RED OSIER DOGWOOD	28	30" x 1/2" / LIVESTAKE	1' OC	
	SALIX HOOKERIANA	HOOKER'S WILLOW	28	30" x 1/2" / LIVESTAKE	1' OC	
	LAWN RESTORATION					
	SOD					SEE DETAIL 6/C-L2

CONSTRUCTION NOTES:

1. ZONE 1 RIPARIAN RESTORATION, SEE DETAIL 1/C-L2
2. ZONE 2 RIPARIAN RESTORATION, SEE DETAIL 2/C-L2
3. COIR LOG PLANTING, SEE DETAIL 3/C-L2
4. ADJUST PLANT INSTALLATION AROUND RETAINED TREES.
5. LAWN RESTORATION, SEE DETAIL 6/C-L2

GENERAL NOTES

1. LOCATE AND PROTECT EXISTING LANDSCAPE IRRIGATION. REPAIR OR REPLACE IF DAMAGED.

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS

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Approved By

DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

JC	09/11/18
DESIGNED BY	DATE
JC	09/11/18
DRAWN BY	DATE
BB	09/11/18
CHECKED BY	DATE

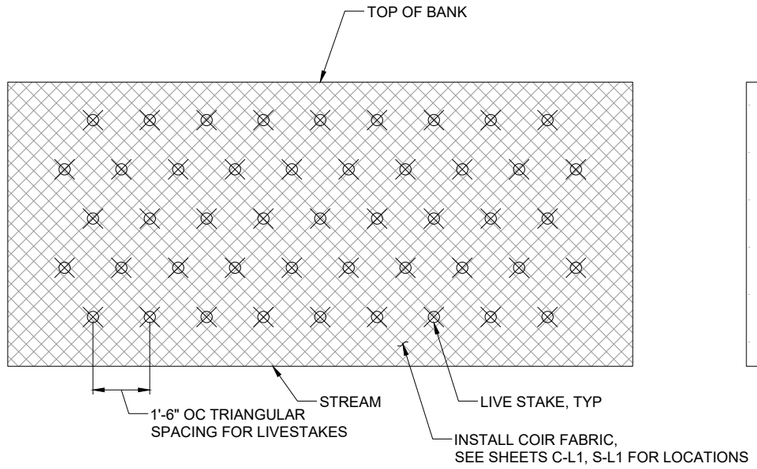
City of Bellevue
UTILITIES

FLOOD HAZARD REDUCTION PROJECT
GLACIER KEY RIPARIAN RESTORATION PLAN

G-L1 | SHT 30 OF 55

NOTE:

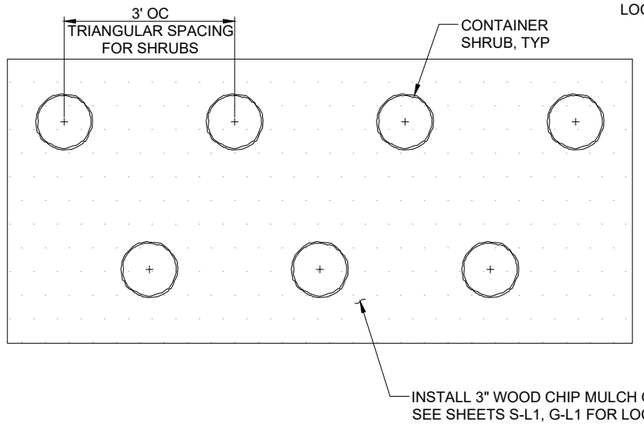
1. INSTALL LIVESTAKES THROUGH COIR FABRIC
2. DISTRIBUTE STAKES RANDOMLY BY SPECIES



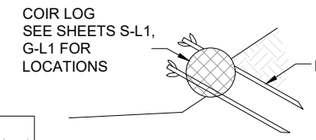
ZONE 1 PLANTING
SCALE: 3/4"=1'-0"
1 S-L1 G-L1

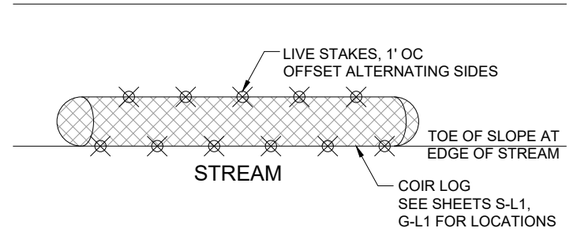
NOTE:

1. PLANT SHRUBS IN SINGLE SPECIES GROUPS OF 3 TO 5 PLANTS
2. INSTALL SHRUBS THROUGH COIR FABRIC, IF PRESENT. SEE DETAIL 5/-

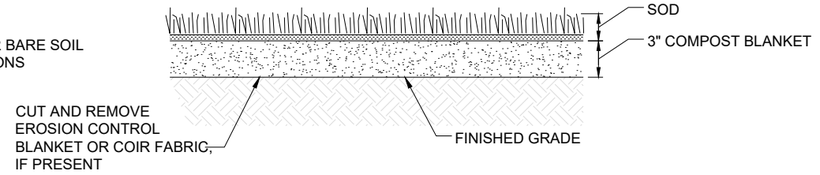


ZONE 2 PLANTING
SCALE: 3/4"=1'-0"
2 S-L1 G-L1

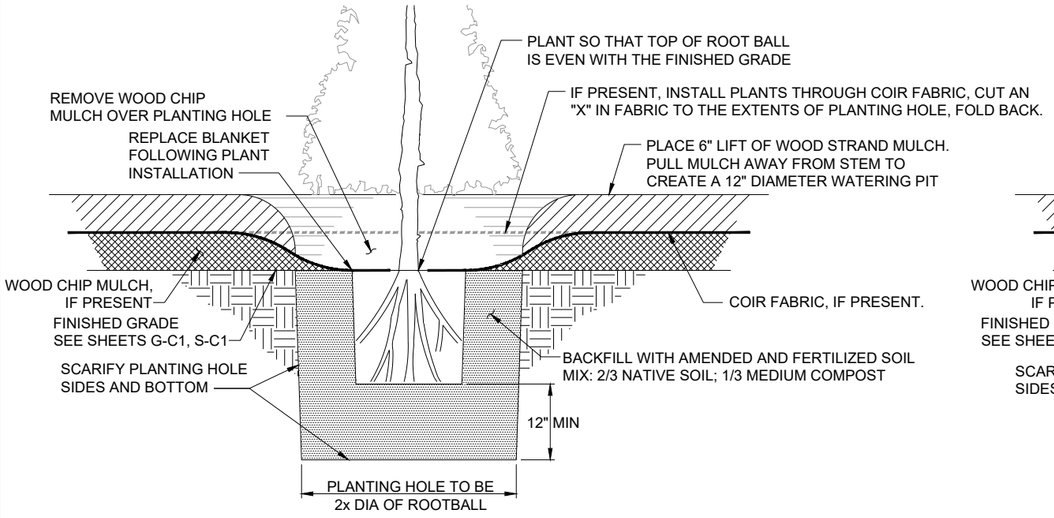




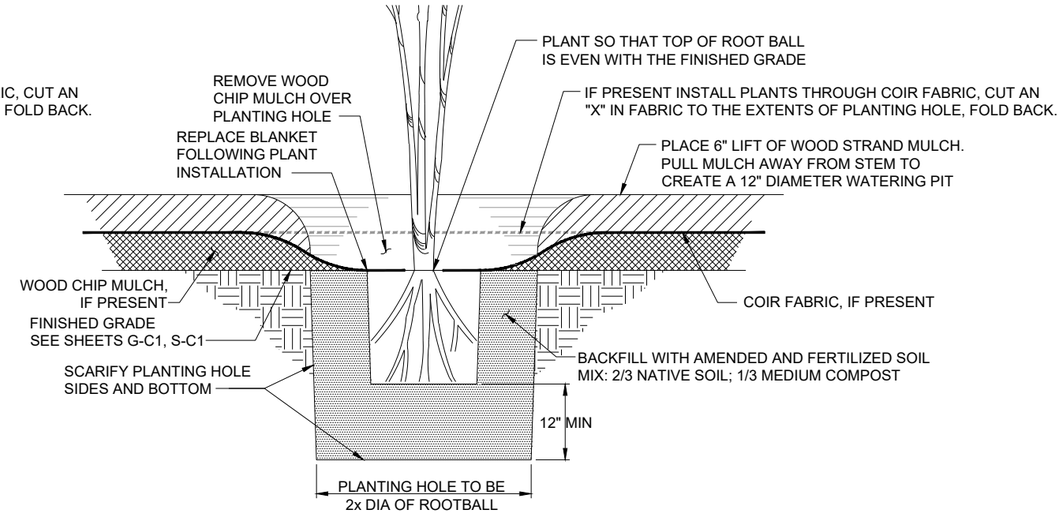
COIR LOG PLANTING
SCALE: 3/4"=1'-0"
3 N-L1 C-L1



LAWN RESTORATION
NO SCALE
6 S-L1 G-L1



TREE PLANTING
NO SCALE
4 S-L1 G-L1



SHRUB PLANTING
NO SCALE
5 S-L1 G-L1

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LANDSCAPE RESTORATION DETAILS

C-L2

SHT 31 OF 55